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10/734,366

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Gerard R. Lazo

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USDA-ARS-OFFICE OF TECHNOLOGY TRANSFER
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EXAMINER

KIM, PAUL

ART UNIT

PAPER NUMBER

2161

DATE MAILED: 06/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/734,366

Applicant(s)

LAZO ET AL.

Examiner

Paul Kim

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.


SAM RIMELL
PRIMARY EXAMINER

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3 June 2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

1. This Office Action is responsive to the following communication: Original Application filed on 12 December 2003.
2. Claims 1-28 are pending and present for examination. Claims 1, 5, 9, 16, and 24 are independent.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. **Claims 1-8, 16-17, and 24** are rejected under 35 U.S.C. 102(e) as being anticipated by Imaichi et al (U.S. Patent 7,047,255, hereinafter referred to as IMAICHI), filed on 27 February 2003, and issued on 16 May 2006.

5. **As per independent claims 1 and 5**, IMAICHI teaches:

A method of displaying data from a relational database comprising the steps of

- a. Providing at least two libraries of data from different sources {See IMAICHI, col. 4, lines 11-18, wherein this reads over "there are provided two document groups"};
- b. Identifying clusters of related data by comparing the data of each library {See IMAICHI, col. 4, lines 29-35, wherein this reads over "documents or words having high relevance degree, in terms of the axis direction subject to clustering, are adjacently plotted in clusters"};
- c. Providing a multi-dimensional display comprising a figure {See IMAICHI, Figures 3-4, 8-10, and 12-15; and col. 4, lines 29-35, wherein this reads over "the elements of either or both of the vertical and horizontal axes are subjected to clustering for rearrangement and the results are displayed in the two-dimensional coordinate system"};
and
- d. Plotting a symbol for each cluster within the multidimensional figure based on a set of coordinates within said multi-dimensional display, wherein said coordinates are a function of a specific comparative

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analysis applied to said data libraries which contributed data to said cluster {See IMAICHI, col. 9-21, wherein this reads over "[b]y displaying the relationship between the documents in the two-dimensional coordinate system, it is possible to grasp at a glance the characteristics of the document groups such as the relationship between document groups as a whole or between individual documents"}₂

6. **As per dependent claims 2 and 6, IMAICHI teaches:**

The method of claim 1, wherein the comparative analysis includes the number of said data libraries which contribute data to said cluster {See IMAICHI, col. 6, lines 1-8, wherein this reads over "wherein T is the total number of documents"}₂

7. **As per dependent claim 3 and 7, IMAICHI teaches:**

The method of claim 1, wherein the comparative analysis includes the amount of data from each library which contributes to said cluster {See IMAICHI, col. 6, lines 1-22, wherein this reads over "df(t) is the number of documents which contain the word (t)" and "}"₂

8. **As per dependent claim 4 and 8, IMAICHI teaches:**

The method of claim 1, wherein the comparative analysis includes the percentage of data from each library that contributes to said cluster {See col. 8, lines 35-38, wherein this reads over "the relevance degree calculation unit calculates the relevance degree between the words and documents"}₂

9. **As per independent claim 16, IMAICHI teaches:**

A computer program for conducting a search for and plotting of alphanumeric data, the computer program being stored on a computer readable medium or transmitted by a propagated signal and comprising:

a. A receiving code segment that causes the computer to receive input including one or more search criteria {See IMAICHI, col. 2, lines 59-60, wherein this reads over "a step for receiving a search request on a document database"} for at least one searchable alphanumeric character in a data library containing alphanumeric characters {See IMAICHI, Figure 6; and col. 8, lines 11-16, wherein this reads over "a search request input unit for inputting search keywords"}₂

b. An assigning code segment that causes the computer to assign a value to each alphanumeric character {See IMAICHI, col. 7, lines 40-43, wherein this reads over "[w]hen each line of the table in FIG. 2 is regarded as a vector, each element of Document Unit A can be expressed as a weighting vector for each element of Document B"}; and

c. A plotting code segment that causes the computer to plot the input on a visual display, said plot relating to said value assigned to the alphanumeric character {See IMAICHI, col. 8, lines 38-42, wherein this reads over "[t]he client visualizes the relevance between the word group and the document group in the two-dimensional coordinate system on the display unit"}₂

10. **As per dependent claim 17, IMAICHI teaches:**

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The computer program of claim 16 wherein the receiving code segment receives input for alphanumeric characters that correspond to at least one contig {See IMAICHI, col. 2, lines 59-60, wherein this reads over "a step for receiving a search request on a document database"; and col. 8, lines 26-28, wherein this reads over "as a result a document group is obtained"}.

11. **As per independent claim 24, IMAICHI teaches:**

A system for plotting and manipulating data points, the system comprising:

- a. A computer program stored on computer readable medium, said program capable of searching, retrieving, and plotting data represented in alphanumeric form {See IMAICHI, col. 2, lines 59-60, wherein this reads over "a step for receiving a search request on a document database"; col. 8, lines 38-42, wherein this reads over "[t]he client visualizes the relevance between the word group and the document group in the two-dimensional coordinate system on the display unit"};
- b. Computer means capable of operating said computer program;
- c. Graphical display means, capable of displaying said data using a plurality of colors.

It is inherent that a system would comprise a computer means capable of operating a computer program. Without said operational capabilities, the system would not be able to search, retrieve, and plot the requested data.

Additionally, it is inherent that the graphical display means use a plurality of colors. Without the use of a plurality of colors, displaying plotted data would not be capable since the display would be presented in only one color.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. **Claims 9-15, 18-23, and 25-28** are rejected under 35 U.S.C. 103(a) as being unpatentable over IMAICHI, in view of Karchi et al (USPGPUB 2004/0121360, hereinafter referred to as KARCHI), filed on 31 March 2002, and published on 24 June 2004.

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IMAICHI teaches the limitations of Claims 1-8, 16-17, and 25 for the reasons stated above.

IMAICHI differs from the claimed invention in that KOBAYASHI fails to disclose ESTs, EST libraries, and contigs (claims 9-15, 17-23, and 26-28).

14. **As per independent claim 9**, IMAICHI, in combination with KARCHI, discloses:

A method for displaying data from a relational database of EST libraries comprising the steps of

a. providing a plurality of EST libraries {See KARCHI, Para. 0160, wherein this reads over "458 available EST libraries"};

b. identifying contigs by comparing the ESTs of said plurality of EST libraries {See KARCHI, Para. 0148, wherein this reads over "data from EST databases containing approximately 125,000 ESTs from 48 libraries" and "Transcribed nucleic acid sequences were computationally clustered and assembled to create contigs"};

c. providing a multi-dimensional display comprising a figure {See IMAICHI, Figures 3-4, 8-10, and 12-15; and col. 4, lines 29-35, wherein this reads over "the elements of either or both of the vertical and horizontal axes are subjected to clustering for rearrangement and the results are displayed in the two-dimensional coordinate system"} having loci distributed about the periphery thereof, wherein each locus is associated with one of said libraries {See IMAICHI, col. 4, lines 29-35, wherein this reads over "documents or words having high relevance degree, in terms of the axis direction subject to clustering, are adjacently plotted in clusters"};

d. plotting a symbol for each contig within the multidimensional display based on a set of coordinates within said multi-dimensional display, wherein each symbol is disposed within the figure at a point within an area between the loci associated with the libraries which contributed to said contig {See IMAICHI, col. 9-21, wherein this reads over "[b]y displaying the relationship between the documents in the two-dimensional coordinate system, it is possible to grasp at a glance the characteristics of the document groups such as the relationship between document groups as a whole or between individual documents"};

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the above invention suggested by IMAICHI by combining it with the invention disclosed by KARCHI. The results of this combination would lead to a method of identifying contigs by comparing ESTs and plotting contig data on a multi-dimensional display.

One of ordinary skill in the art would have been motivated to do this modification so that an overall visual representation of data (specifically, ESTs and contigs) may be presented by plotting data which have been gathered and clustered by common attributes.

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15. **As per dependent claims 10, 18, and 26**, IMAICHI, in combination with KARCHI, discloses:

The method of claim 9, wherein said coordinates are determined as a function {See IMAICHI, col. 5, lines 41-45, wherein this reads over "these can be elements to be plotted on the vertical axis or horizontal axis of the two-dimensional coordinate system"} of the number of said libraries {See IMAICHI, col. 9-21, wherein this reads over "[b]y displaying the relationship between the documents in the two-dimensional coordinate system, it is possible to grasp at a glance the characteristics of the document groups such as the relationship between document groups as a whole or between individual documents"} which contributed ESTs to said contig {See KARCHI, Para. 0148, wherein this reads over "data from EST databases containing approximately 125,000 ESTs from 48 libraries" and "Transcribed nucleic acid sequences were computationally clustered and assembled to create contigs"}.

16. **As per dependent claim 11, 19, and 27**, IMAICHI, in combination with KARCHI, discloses:

The method of claim 9, wherein said coordinates are determined as a function {See IMAICHI, col. 5, lines 41-45, wherein this reads over "these can be elements to be plotted on the vertical axis or horizontal axis of the two-dimensional coordinate system"} of the proportion {See IMAICHI, col. 6, lines 1-22, wherein this reads over "df(t) is the number of documents which contain the word (t)" and "} of ESTs in said contig contributed by each of said libraries {See KARCHI, Para. 0148, wherein this reads over "data from EST databases containing approximately 125,000 ESTs from 48 libraries" and "Transcribed nucleic acid sequences were computationally clustered and assembled to create contigs"}.

17. **As per dependent claim 12, 20 and 28**, IMAICHI, in combination with KARCHI, discloses:

The method of claim 9, wherein said coordinates are determined as a function {See IMAICHI, col. 5, lines 41-45, wherein this reads over "these can be elements to be plotted on the vertical axis or horizontal axis of the two-dimensional coordinate system"} of the number {See IMAICHI, col. 6, lines 1-22, wherein this reads over "df(t) is the number of documents which contain the word (t)" and "} of ESTs in said contig from a given library relative to the total number of ESTs in said library {See KARCHI, Para. 0148, wherein this reads over "data from EST databases containing approximately 125,000 ESTs from 48 libraries" and "Transcribed nucleic acid sequences were computationally clustered and assembled to create contigs"}.

18. **As per dependent claim 13**, IMAICHI, in combination with KARCHI, discloses:

The method of claim 9, and further comprising selecting a subset of said libraries {See KARCHI, Para. 0160, wherein this reads over "[o]ut of 458 available EST libraries, 48 containing > 50 ESTs were selected"} distributed about the periphery of said multi-dimensional display and repeating steps (b) through (d).

19. **As per dependent claim 14**, IMAICHI, in combination with KARCHI, discloses:

The method of claim 9, and further comprising rearranging said libraries {See IMAICHI, Figures 3-4, 8-10, and 12-15; and col. 4, lines 29-35, wherein this reads over "the elements of either or both of the vertical and horizontal axes are subjected to clustering for rearrangement and the results are displayed in the two-dimensional coordinate system"}.

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distributed about the periphery of said multi-dimensional display and repeating steps (b) through (d).

20. **As per dependent claim 15**, IMAICHI, in combination with KARCHI, discloses:

The method of claim 9, wherein said libraries are selected from one or more libraries based on species, cultivar, tissue, developmental stage, or stress condition {See KARCHI, Para. 0038, wherein this reads over "the type of tissues from which the transcribed nucleic acid sequences were derived" and "the number of clusters of said transcribed nucleic acid sequences generated by the library from which said contigs are derived"}.

21. **As per dependent claims 21-23**, IMAICHI, in combination with KARCHI, discloses:

The computer program of claim 18 (also 19 and 20) wherein the plotting code segment plots {See IMAICHI, col. 8, lines 38-42, wherein this reads over "[t]he client visualizes the relevance between the word group and the document group in the two-dimensional coordinate system on the display unit"} a plurality of contigs on a visual display thus enabling a computer user to see relationships between and among said plotted contigs {See KARCHI, Figures 3 and 4}.

22. **As per dependent claim 25**, IMAICHI, in combination with KARCHI, discloses:

The system of claim 24, wherein the computer program searches, retrieves, and plots {See IMAICHI, col. 2, lines 59-60, wherein this reads over "a step for receiving a search request on a document database"; col. 8, lines 38-42, wherein this reads over "[t]he client visualizes the relevance between the word group and the document group in the two-dimensional coordinate system on the display unit"} contigs assembled from libraries containing EST data {See KARCHI, Para. 0003, wherein this reads over "a method and system for efficiently detecting a group of a relatively small number of documents having the same or similar keyword (hereinafter referred to as an outlier cluster"; and Para. 0148, wherein this reads over "data from EST databases containing approximately 125,000 ESTs from 48 libraries" and "Transcribed nucleic acid sequences were computationally clustered and assembled to create contigs"}.

Conclusion

23. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Zhang et al (U.S. Patent 5,832,182) which teaches and discloses a method and system for clustering multi-dimensional data to determine patterns.
- Bradley et al (U.S. Patent 6,449,612) which teaches and discloses a system for finding cluster of data items in a database.

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- Aono et al (U.S. Patent 6,920,450) which teaches and discloses a method for retrieving, detecting, and identifying major and outlier clusters in a database.

24. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul Kim whose telephone number is (571) 272-2737. The examiner can normally be reached on M-F, 9am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey Gaffin can be reached on (571) 272-4146. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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SAM RIMELL
PRIMARY EXAMINER